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Psychosocial Dysfunction Associated with Skin Picking Disorder and Trichotillomania

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Abstract

Skin picking disorder (SPD) and trichotillomania (TTM) are common and oftentimes disabling disorders. 125 participants with SPD and 152 with TTM undertook clinical and neurocognitive evaluation, and were grouped according to mild, moderate, or severe levels of psychosocial dysfunction. Relationships between functional impairment and other variables were explored using linear regression and categorical analyses. Greater functional impairment was associated with worse disease severity in both groups, and by later symptom onset and lower quality of life in TTM subjects. These results indicate that levels of self-reported psychosocial dysfunction have a strong association with specific clinical aspects of SPD and TTM.

Key Words: impairment, disability, trichotillomania, skin picking, cognition

1. Introduction

Skin picking disorder (SPD) and trichotillomania (TTM) and are often debilitating conditions (Christenson et al., 1991; Woods et al., 2006; Grant et al., 2012). Not everyone with SPD or TTM, however, reports significant psychosocial impairment, and variables associated with impairment have yet to be clearly delineated. Understanding why certain individuals with SPD and TTM are more psychosocially impaired than others may be important in order to identify potentially clinically useful subtypes and optimize treatment.

Our hypothesis is that SPD and TTM reflect a complex clinical and cognitive interaction which exhibits itself in various levels of psychosocial dysfunction, and that the level of dysfunction may inform us about the heterogeneity within these disorders. We sought to investigate the clinical and cognitive profiles of adults with various levels of dysfunction. Based on the extant literature (Tung et al., 2015; Chamberlain et al., 2006; Odlaug et al., 2010), we hypothesized that individuals with greater psychosocial dysfunction would exhibit more severe SPD and TTM and, on a cognitive level, would display greater impairment of response inhibition.

2. Methods

2.1 Subjects

Data from 125 adults with SPD and 152 with TTM taking part in various research studies at two university centers were included in this study. Inclusion criteria included males and females aged 18 to 65 years with a primary diagnosis of either SPD or TTM. Exclusion criteria included current psychotic disorders, bipolar disorder, or past six-month history of substance use disorders, and an inability to understand study procedures and provide written informed consent.

2.2 Assessments

Current and lifetime psychiatric comorbidity was assessed using the Structured Clinical Interview for DSM-IV (SCID) disorders (First et al., 1995) and SCID-compatible modules for impulse control disorders (Grant et al., 2008). Adults with SPD completed the Yale–Brown Obsessive–Compulsive Scale Modified for Neurotic Excoriation (NE-YBOCS), a clinician-administered scale examining urges to pick and picking behavior for the past week (Arnold et al., 1999). Participants with TTM completed the *Massachusetts General Hospital Hairpulling Scale (MGH-HPS)* (Keuthen et al., 1995), a self-report assessment of TTM severity for the past week.

In addition, all subjects completed the following: *Sheehan Disability Scale (SDS) (Sheehan, 1983)*, *Clinical Global Impression - Severity of Illness (CGI-S)* (Guy, 1976), *Quality of Life Inventory (QoLI)* (Frisch et al., 1993), 17-item *Hamilton Depression Rating Scale* (Hamilton, 1960), and the *Hamilton Anxiety Rating Scale* (Hamilton, 1959).

2.3 Cognitive Testing

Cognitive assessments consisted of two previously validated tests taken from CANTABeclipse software. Previous research has found that individuals with SPD and TTM often exhibit significant deficits of motor inhibition and cognitive flexibility compared to healthy controls (Chamberlain et al., 2006; Odlaug et al., 2010). All testing was conducted in the same controlled environment, and the order of the tasks was fixed.

Stop-signal task (SST). The Stop-signal task is a well-validated task quantifying the ability to suppress impulsive responses (Logan et al., 1984).

Intra-dimensional/Extra-dimensional Set Shift task (IDED) (Owen et al., 1991). The IDED task includes aspects of rule learning and behavioral flexibility (Lezak, 2004).

2.4 Data Analysis

We used both a dimensional as well as a categorical approach and examined TTM and SPD groups separately. We used linear regression to examine the clinical and cognitive correlations with the SDS total score (all variables listed in Table 1, except duration of illness, were included in the regression analyses). Because linear regression is unfamiliar and arguably less useful to clinicians, we also examined the SDS total score in a categorical analysis. Based on the total SDS score, subjects were categorized as mild or no impairment (score 0 – 10), moderate psychosocial impairment (score of 11 – 20), or severe impairment (score of 21 – 30) based on the anchors provided by the scale (Sheehan et al., 1996).

Potential differences between groups were explored using analysis of variance (ANOVA) (or chi-square for non-parametric tests as appropriate). This being an exploratory study, statistical significance was defined as $p<0.05$ uncorrected. SPSS Statistics version 18 (SPSS Inc., 2009) was used for all analyses.

3. Results

125 adults with primary SPD and 152 participants with primary TTM took part in the study. Demographic characteristics in either group did not differ as a function of impairment (Table 1). 21 of 125 participants with primary SPD (16.8%) also had secondary TTM, and 40 (26.3%) of those with primary TTM also had secondary SPD. There was no overlap in the two

samples. Additionally, 64 (51.2%) of SPD participants had a current psychiatric disorder that was not TTM, and 67 (44.1%) of TTM subjects had a psychiatric disorder other than SPD.

In the case of TTM, using linear regression with SDS total score as the dependent variable, there was a significant model identified ($F=25.236$, $p<0.001$) with MGH-HPS total score (i.e. worse disease severity) ($t=7.021$, $p<0.001$), the QoLI t-score (lower quality of life) ($t=-2.515$, $p=0.013$), and older age at onset ($t=2.435$, $p=0.016$) all being significant associated variables. In the categorical analysis for TTM participants (Table 1), there was a main effect of functional impairment level on age of onset ($p=0.001$), MGH-HPS total score ($p<0.001$), CGI-S ($p<0.001$), HAM-D ($p=0.004$), and HAM-A scores (0.012). Cognitive performance did not differ significantly contingent on functional impairment category (all $p>0.10$).

In the case SPD, the linear regression analysis with SDS total score as the dependent variable identified a significant model ($F=40.269$, $p<0.001$) with NE-YBOCS total score being the only significantly associated variable ($t=6.346$, $p<0.001$). Thus, higher psychosocial dysfunction was significantly associated with worse disease severity. In the categorical analysis for SPD (Table 1), there was a significant effect of psychosocial function on NE-YBOCS total score ($p<0.001$), CGI-S ($p<0.001$), and QoLI t-score ($p=0.025$). Cognitive performance did not differ significantly as a function of psychosocial impairment (all $p>0.10$).

4. Discussion

In this study, we determined the clinical and cognitive correlates of psychosocial dysfunction in 152 individuals with TTM and 125 with SPD. Both disorders demonstrated high rates of psychosocial dysfunction, with 56% of the adults with SPD and 44% of the TTM adults reporting moderate or severe impairment due to these behaviors. Not surprisingly, greater

dysfunction in both disorders was associated with worse symptom severity, in the absence of potential confounding differences such as age, gender, and education levels. This is in keeping with previous research (Tucker et al., 2011; Woods et al., 2006). Because of the frequent noticeable scarring from picking and hair loss from pulling, it is not surprising that individuals would report problems in social and work environments.

There were, however, some important clinical differences between TTM and SPD. Depression and anxiety were significant aspects of dysfunction in TTM using the categorical approach, whereas these were not significant for SPD. Our findings in TTM are consistent with a recent study which found that depressive and anxiety symptom severity impacted psychosocial functioning even in the absence of formal depression and anxiety diagnoses (Tung et al., 2015). One possible reason for the difference in our results between TTM and SPD could be the overall low depressive and anxiety symptoms reported by SPD participants in this study. With low levels of symptoms, significant differences would be more difficult to detect. Many people with SPD who also have severe depression and anxiety may choose not to participate in research protocols and instead seek treatment directly.

Another important difference between TTM and SPD was the fact that older age at TTM onset was associated with greater impairment using both statistical approaches, and this was not the case in SPD. Because previous research has found that older age at TTM onset is associated with more severe hair pulling symptoms (Odlaug et al., 2012), this finding may reflect the notion that age at onset is associated with severity which, in turn, is associated with impairment.

There are several possible explanations for the associations between elevated dysfunction and more severe disorder-specific symptoms and, in the case of TTM, general psychosocial variables. One explanation might be that worse picking and pulling leads to greater psychosocial

dysfunction which, in the case of TTM, then leads to greater depression and anxiety. This explanation would prioritize the pulling as the nidus for the chain reaction of events. Alternatively, if the psychosocial dysfunction is fairly chronic then this could lead to worse symptom severity as the person is isolated, not getting out of the home and therefore pulls more or has less motivation to control the behavior. Finally, another explanation could be that certain variables such as anxiety and depression lead to worse pulling and in turn both create more psychosocial dysfunction. Given that this study did not examine causality, these explanations remain speculative.

4.1 Limitations

This study has several positive features, but some limitations should be considered. First, impairment was examined with a self-report measure assessing only the past week. Second, the correlated variables all came from participants rather than collecting corroborative information from loved ones. Third, the majority of participants was female and so these findings may not apply to males. Fourth, the NE-YBOCS has questions regarding interference of symptoms on a person's life and so may share some overlap with the SDS. Finally, the study is cross-sectional in nature and a prospective study may provide greater insight regarding the temporal relationship of TTM and SPD symptoms to psychosocial dysfunction.

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Table 1. Characteristics of Individuals with Trichotillomania (n=152) or Skin Picking (n=125) Grouped by Level of Psychosocial Dysfunction

Trichotillomania Participants	**Mild or No Dysfunction N=85**	**Moderate Dysfunction N=55**	**Severe Dysfunction N=12**	**Test statistic**	***p***	**Degrees of freedom**
DEMOGRAPHICS						
Age	33.3 (11.1)	30.6 (10.4)	34.0 (12.3)	1.143	0.321	151
Female, n (%)	75 (88.2)	50 (90.9)	11 (91.7)	0.519#	0.972	4
Relationship Status, n (%) Married	34 (40.0)	14 (25.5)	6 (50.0)	6.580#	0.583	8
Education, n (%) High school or less	17 (20.0)	13 (23.6)	5 (41.7)			
At least some college	68 (80.0)	42 (76.4)	7 (58.3)	10.727#	0.218	8
Unemployed, n (%)	2 (2.4)	1 (1.8)	0 (0)	15.068#	0.238	12
CLINICAL AND COGNITIVE ASSOCIATIONS						
Age of Trichotillomania onset	11.5 (3.9)	14.0 (7.5)	17.8 (10.8)	6.993	**0.001**	151
Duration of Illness (Trichotillomania)	21.8 (11.4)	16.6 (9.8)	16.2 (13.1)	4.343	**0.015**	151
MGH-HPS total score	15.7 (4.5)	19.3 (3.1)	21.9 (2.4)	21.906	**<0.001**	151
CGI-S	4.3 (0.7)	4.7 (0.8)	5.1 (0.8)	10.109	**<0.001**	151
HAM-D	3.9 (3.1)	4.3 (3.6)	7.8 (6.5)	5.782	**0.004**	151
HAM-A	3.9 (3.1)	4.3 (3.4)	7.0 (4.7)	4.585	**0.012**	151
QOLI t-score	29.0 (23.7)	25.9 (22.7)	17.8 (38.5)	1.132	0.334	149
Any current comorbid psychiatric disorder, n (%)	34 (40.0)	28 (50.9)	5 (41.7)	1.643#	0.440	2
IDED: Total errors, adjusted	21.7 (26.6)	24.3 (20.2)	31.3 (23.8)	0.466	0.629	87
SST: SSRT	178.8 (52.8)	188.9 (62.5)	177.1 (42.2)	0.348	0.702	85
Skin Picking Participants	**Mild or No Dysfunction N=55**	**Moderate Dysfunction N=59**	**Severe Dysfunction N=11**	**Test statistic**	***p***	**Degrees of freedom**
DEMOGRAPHICS						
Age	35.9 (13.1)	33.0 (11.2)	31.3 (7.4)	1.254	0.289	124
Female, n (%)	49 (89.1)	50 (90.1)	10 (90.1)	1.451#	0.835	2
Relationship Status, n (%) Married	21 (38.2)	27 (45.8)	2 (18.2)	8.449#	0.207	6
Education, n (%) High school or less	3 (5.5)	2 (3.4)	1 (9.1)			
At least some college	52 (94.5)	57 (96.6)	10 (90.9)	5.795#	0.832	10
Unemployed, n (%)	6 (10.9)	1 (1.7)	0 (0)	15.366#	0.222	12
CLINICAL AND COGNITIVE ASSOCIATIONS						
Age of skin picking onset	13.4 (11.1)	13.2 (7.4)	9.5 (4.3)	0.907	0.407	124
Duration of Illness (Skin Picking Disorder)	22.5 (12.9)	19.8 (12.6)	21.8 (10.1)	0.683	0.507	124
NE-YBOCS total score	16.6 (4.4)	19.4 (4.6)	24.9 (4.7)	17.225	**<0.001**	124
CGI-S	4.0 (0.6)	4.4 (0.7)	5.0 (0.9)	13.302	**<0.001**	124
HAM-D	4.7 (3.9)	4.3 (4.0)	5.1 (3.4)	0.230	0.795	124
HAM-A	4.8 (4.1)	4.0 (3.3)	4.9 (3.1)	0.845	0.432	124
QOLI t-score	42.8 (10.9)	44.9 (10.6)	34.5 (18.1)	3.820	**0.025**	123
Any current comorbid psychiatric disorder, n (%)	26 (47.3)	30 (50.8)	9 (81.8)	4.442#	0.108	2
IDED: Total errors, adjusted	21.7 (17.4)	20.7 (19.4)	18.8 (16.9)	0.099	.906	89
SST: SSRT	196.6 (66.3)	207.6 (105.4)	184.2 (53.8)	0.327	.722	89

All values are mean (SD) unless otherwise indicated. Test statistic is ANOVA unless indicated # (chi-square).

CGI-S=Clinical Global Impression – Severity of Illness; HAM-A=Hamilton Anxiety Rating Scale; HAM-D=Hamilton Depression Rating Scale; QOLI=Quality of Life Inventory; IDED= Intra-dimensional/Extra-dimensional Set Shift task; SST=Stop Signal Task; SSRT=Stop Signal Reaction Time